INFORMATION SHEET

ORDER NO.
CITY OF LATHROP AND CALIFIA, LLC
WASTEWATER TREATMENT FACILITY
SAN JOAQUIN COUNTY

Background

The City of Lathrop has constructed a wastewater facility that it will own and operate for a new planned community that consists of residential and commercial developments. The wastewater treatment facility (WWTF) will include the wastewater treatment plant, wastewater collection system, recycled water storage ponds, recycled water delivery system, and all the designated land application areas. Califia LLC owns portions of the land application areas. Both entities are hereafter referred to as "Discharger." The mechanical treatment equipment will be located adjacent to the existing City of Lathrop Crossroads wastewater treatment facility, but the two systems will not share equipment or storage ponds with the exception of sludge dewatering equipment. The Crossroads treatment plant is regulated by Waste Discharge Requirements (WDRs) Order No. 5-01-251.

Because the developments are under construction, wastewater flow rates are expected to grow over time. The Discharger has stated the treatment equipment can't be operated until a flow rate of at least 40,000 gpd is reached. Until a flow rate of 40,000 gpd is reached, wastewater will be discharged to the Manteca wastewater system through the existing pipeline that serves the existing residential developments in Lathrop.

The WWTF will provide wastewater treatment for domestic and commercial wastewater generated in the Mossdale Village and River Islands subdivisions. The WWTF has been designed to serve only the developments, which are planned residential communities with some commercial development. Single-family dwellings are presently under construction in the Mossdale Village area but no buildings are occupied. The developments will be constructed in sequences. In the first development sequence, approximately 750,000 gallons per day (gpd) of domestic wastewater from approximately 1,482 low, medium, and high-density residential developments as well as commercial establishments is anticipated. The first sequence is further divided into Phase I and Phase II for wastewater permitting purposes. Additional wastewater treatment and land application facilities and/or expansion of the proposed WWTF may be designed and permitted under a separate permitting process.

The mechanical treatment equipment will provide a treatment capacity of 750,000 gpd. However, this Order initially allows 187,600 gpd based on the limited availability of land application areas. In Phase I, 69 acres of potential land application areas were identified. However, recycled water will be applied to only 44.3 acres of land application areas due to groundwater quality concerns. An additional 294 acres has been proposed for Phase II use. With site improvements and submittal of a technical report demonstrating the wastewater system capacity, the Discharger can request the Executive Officer increase the wastewater flow rate to 750,000 gpd.

However, the 750,000-gallon per day flow rate will not be adequate for the future development that is planned. The Discharger will submit future sequenced Reports of Waste Discharge. The Discharger has stated in California Environmental Quality Act (CEQA) documents that as development proceeds, they

expect to obtain a future NPDES permit to allow recycled water discharge to surface waters. Issuance of this Order for a discharge of recycled water to land in no way guarantees that the Dischargers will obtain an NPDES permit. In addition, issuance of this Order does not guarantee a future increase in the volume of recycled water discharged to land beyond 750,000 gpd.

The treatment plant will provide tertiary treatment and disinfection using a Membrane Bioreactor (MBR) system. The treatment system consists of flow measurement, screening, grit removal, flow equalization, membrane bioreactors, and chlorine disinfection. The mechanical treatment portion of the WWTF is designed for an average dry weather flow capacity of 750,000 gpd. A 950,000 gallon flow equalization tank will provide short-term emergency retention if a system component fails. Wastewater in the flow equalization tank will be metered into the treatment system, as capacity is available. The system has been constructed in a modular approach to allow future expansion. Recycled water (treated wastewater) will be discharged to ponds (Pond No. 3 in Phase I and/or Pond No. E in Phase II) which are located adjacent to the wastewater treatment equipment. Recycled water will be stored at the mechanical treatment equipment location (Ponds 3 and/or E), at additional ponds located at Mossdale Village, and at an off-site recycled storage pond located north of the wastewater treatment equipment. In Phase I, a total of approximately 270.3 ac•ft of storage capacity will be available; in Phase II an additional 208.6 ac•ft of storage capacity will be available for a total of 478.9 ac•ft of storage capacity.

Recycled water will be applied during spring, summer, and fall months but if conditions allow, application during winter months is acceptable. Recycled water will be stored in High Density Polyethylene (HDPE) lined storage ponds and applied to cropped land application areas. Land application areas consist of landscaped areas, turf areas, and fodder crop areas. Recycled water will be applied by drip irrigation, flood irrigation, or sprinklers at agronomic rates for both nitrogen and water application. Irrigation tailwater will be controlled in some areas using perimeter berms, grading the area to prevent off-site drainage, and/or management controls. Because the RWD does not describe specific management practices for each area that will receive recycled water, this Order does not allow recycled water to be applied to any area until the Executive Officer approves a *Recycled Water Application Plan* for that area.

Biosolids Disposal

Screenings and grit removed from the wastewater will be dewatered and sent to a dumpster, prior to being hauled off-site to the local landfill for disposal. Waste Activated Sludge (WAS) will be stored in a WAS Storage Tank and dewatered using a belt filter press. Dewatered sludge will be hauled for subsequent land application at Brisco Enterprises of Merced under Waste Discharge Requirements Order No. 94-030.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water from the WWTF is to the San Joaquin River (within the Sacramento San Joaquin Delta). The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses

often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic and municipal supply in this instance) of groundwater, procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan.

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Board to evaluate that fully characterizes:

- All waste constituents to be discharged;
- The background quality of the uppermost layer of the uppermost aquifer;
- The background quality of other waters that may be affected;
- The underlying hydrogeologic conditions;
- Waste treatment and control measures;
- How treatment and control measures are justified as best practicable treatment and control;
- The extent the discharge will impact the quality of each aquifer; and
- The expected degree of degradation below water quality objectives.

In allowing a discharge, the Regional Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

Certain domestic wastewater constituents are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater. Some degradation for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of municipal utility service to the State far outweigh the environmental impact of a community that would otherwise be reliant on numerous concentrated individual wastewater systems. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the

maximum benefit to the People of the State but does not authorize pollution (i.e., violation of any water quality objective).

Groundwater monitoring has been conducted at the site but the area monitored is large, no systematic program for characterization was implemented, and data was collected without sampling and analysis plans or quality assurance plans; therefore staff are unable to establish the most appropriate groundwater limits. In addition, certain aspects of wastewater treatment and control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). Reasonable time is necessary to gather specific information about the WWTF to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes interim receiving water limitations to assure protection of the beneficial uses of groundwater of the State pending the completion of certain tasks and provides time schedules to complete specified tasks. During this period, degradation may occur from certain constituents, but can never exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance.

Water quality objectives define the least stringent limits that could apply as water quality limitations for groundwater at this location, except where natural background quality unaffected by the discharge of waste already exceeds the objective. The values below reflect water quality objectives that must be met to maintain specific beneficial uses of groundwater. Unless natural background for a constituent proves higher, the groundwater quality limit established in proposed Order is the most stringent of the values for the listed constituents.

Constituent	Units	Value	Beneficial Use	Criteria or Justification
Ammonia	mg/L	1.5	MUN [1]	Taste and Odor [2]
Boron	mg/L	0.7	AGR [3]	Boron Sensitivity [4]
	mg/L	1.0	MUN[1]	Calif. Drinking Water Action Level[11]
Chloride	mg/L	106	AGR [3]	Chloride sensitivity on certain crops irrigated via sprinklers [4]
		142	AGR [3]	Chloride sensitivity on certain crops [4]
		250	MUN [1]	Recommended Secondary MCL [5]
		500	MUN [1]	Upper Secondary MCL [5]
Iron	mg/L	0.3	MUN [1]	Secondary MCL [6]
Manganese	mg/L	0.05	MUN [1]	Secondary MCL [6]
Nitrate plus Nitrite as N	mg/L	10	MUN [1]	Primary MCL [7]
Nitrite as N	mg/L	1	MUN [1]	Primary MCL [7]
Sodium	mg/L	69	AGR [3]	Sodium sensitivity on certain crops [4]
Total Dissolved Solids	mg/L	450[8]	AGR [3]	Salt sensitivity [4]
		500	MUN [1]	Recommended Secondary MCL [5]
		1,000	MUN [1]	Upper Secondary MCL [5]
Total Coliform Organisms	MPN/100 ml	<2.2	MUN [1]	Basin Plan
Trihalomethanes	µg/L	100	MUN [1]	MCL [8]
Bromoform	µg/L	4	MUN [1]	USEPA Cancer Potency Factor [9]
Bromodichloromethane	µg/L	0.27	MUN [1]	Cal/EPA Cancer Potency Factor [12]
Chloroform	µg/L	1.1	MUN [1]	Cal/EPA Cancer Potency Factor [12]
Dibromochloromethane	µg/L	0.37	MUN [1]	Cal/EPA Cancer Potency Factor [12]
pH	pH Units	6.5 to 8.5	MUN [1]	Secondary MCL [10]
		6.5 to 8.4	AGR [3]	Protect sensitive crops [4]

1 Municipal and domestic supply

2 J.E. Amoore and E. Hautala, *Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, Journal of Applied Toxicology, Vol. 3, No. 6 (1983).
3 Agricultural supply
4 Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985)
5 Title 22, California Code of Regulations (CCR), Section 64449, Table 64449-B
6 Title 22, CCR, Section 64449, Table 64449-A
7 Title 22, CCR, Section 64431, Table 64431-A
8 Title 22, CCR, Section 64439
9 USEPA Integrated Risk Information System
10 Title 40, Code of Federal Regulations, Section 143.3
11 California Department of Health Services, Division of Drinking Water and Environmental Management, Drinking Water Action Levels, http://www.dhs.cahwnet.gov/ps/ddwem.
12 CAL/EPA Toxicity Criteria Database (OEHHA)

Domestic wastewater contains numerous dissolved organic and inorganic constituents that together comprise Total Dissolved Solids (TDS). Each component constituent is not individually critical to any beneficial use. Critical constituents are individually listed. The cumulative impact from the other constituents, along with the cumulative affect of the constituents that are individually listed can be effectively controlled using TDS as a generic indicator parameter.

Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride tends to pass through both rapidly to groundwater. However, groundwater chloride concentrations in the region are highly variable, which might limit the use of chloride as an indicator parameter of groundwater degradation. Boron is another TDS constituent that may occur in recycled water in concentrations greater than in groundwater because it is a common ingredient of detergents. Other indicator constituents for monitoring for groundwater degradation due to land application of recycled water include total coliform bacteria, ammonia, total nitrogen, and Total Trihalomethanes (TTHMs) a by-product of chlorination. Dissolved iron and manganese are useful indicators to determine whether components of the WWTF with high-strength wastewater constituents, such as sludge handling facilities, are ineffective in containing waste. Exceptionally high TDS and nitrogen also typifies this type of release.

Treatment Technology and Control

Given the character of domestic wastewater, secondary treatment technology is generally sufficient to control degradation of groundwater from decomposable organic constituents. Adding disinfection significantly reduces populations of pathogenic organisms, and reasonable soil infiltration rates and unsaturated soils can reduce them further. Neither organics nor total coliform organisms, the indicator parameter for pathogenic organisms, should be found in groundwater in a well-designed, well-operated facility. Due to the level of potential exposure to residents, the Discharger has elected to perform tertiary treatment with chlorine disinfection on the wastewater. Chlorine disinfection of effluent causes formation of trihalomethanes, which are toxic priority pollutants. Treatment to reduce these in wastewater generally has not been performed, and little is known at this point on the typical impact on groundwater.

Domestic wastewater typically contains nitrogen in concentrations greater than water quality objectives, which vary according to the form of nitrogen. Groundwater degradation by nitrogen can be controlled by an appropriate secondary treatment system (e.g., oxidation ditch), tertiary treatment with nitrogen reduction, and agronomic reuse crops that are harvested and removed from the land application area. The effectiveness varies, but generally best practicable treatment and control is able to control nitrogen degradation of groundwater at a concentration well below the water quality objectives. The proposed interim limitation reflects water quality objectives.

Dissolved solids can pass through the treatment process and soil profile; effective control of such constituents relies primarily upon source control and pretreatment measures. In the best of circumstances, long-term land discharge of recycled water will degrade groundwater with dissolved solids (as measured by TDS and EC). The proposed Order sets water quality objectives for the interim while site-specific, constituent-specific limits are developed in conjunction with a BPTC evaluation of source control and pretreatment.

Other constituents in domestic wastewater that may pass through the treatment process and the soil profile, include recalcitrant organic compounds, radionuclides, and pharmaceuticals. Hazardous compounds are not usually associated with domestic wastewater and when present are reduced in the discharge to inconsequential concentrations through dilution and treatment. It is inappropriate to allow degradation of groundwater with such constituents, so proposed limits are nondetectable concentrations.

A discharge of recycled water that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under conditions of low soil pH (below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Overloading the land application areas is preventable. Though iron and manganese limits are set at the water quality objective, groundwater pH is expected to remain the same as background.

Title 27

Title 27, CCR, Section 20005 et seq. ("Title 27"), contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent is acceptable under Title 27 regulations.

Discharges of domestic sewage and recycled water can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have been conditionally exempted from Title 27. Discharges of domestic sewage and treated effluent which are regulated by WDRs and treatment and storage facilities associated with the WWTF are considered exempt from Title 27 under Section 20090(a), provided that the discharges and facilities will not result in a violation of any water quality objective. As the exemption specifically excludes the discharge to land of: 1) solid waste

such as grit and screenings that result from treatment of domestic sewage, and 2) residual sludge that will not be further treated at the WWTF, such discharges must comply with provisions of Title 27.

The discharge of recycled water and the operation of treatment and/or storage facilities associated with a wastewater treatment plant can be allowed without requiring compliance with Title 27 only if groundwater degradation complies with the Basin Plan, Resolution No. 68-16 (Antidegradation Policy), and does not violate any water quality objectives.

Proposed Order Terms and Conditions

Discharge Prohibitions and Specifications

Prior to beginning wastewater treatment, the proposed Order requires the Discharger to submit a *Recycled Water Application Plan*. The Plan will establish that treatment equipment is operational, that groundwater monitoring wells have been installed, and will include an operation and maintenance plan for the system. Upon approval by the Executive Officer, the initial wastewater flow rate limit is a monthly average of 187,600 gpd. The initial flow rate is based on the land application areas that will be available on startup (the Phase I land application areas). The RWD proposed a total of 69 acres of land application area for Phase I. The Discharger has proposed that wastewater would only be applied at land application areas where the underlying groundwater TDS concentration was at least 1,000 mg/L. Based on staff's review of the data, approximately 24.7 acres did not meet the Discharger's groundwater TDS criterion; therefore, the flow rate has been reduced from the proposed flow rate of 278,000 gpd to 187,600 gpd.

The Order allows the flow rate to increase to 750,000 gpd based on submittal, and approval by the Executive Officer, of the *Recycled Water Expansion Report* which will document the treatment system capacity, the availability of land application areas, and updates to technical reports such as the *As Built Report*, *Recycled Water Application Plan*, and *Sanitary Sewer Overflow Plan*. Some of the areas proposed for Phase II application may not be suitable for recycled water application based on preliminary characterization of underlying groundwater quality. The Discharger can perform additional investigations to support future consideration of the land areas.

The proposed Order's Effluent Limitations for BOD_5 and TSS are based on the predicted recycled water quality as stated in the RWD. The RWD did not predict TDS quality; that limit is based on the municipal supply water quality plus 200 mg/L, which is a reasonable increase in salinity based on domestic water use. The discharge specifications regarding dissolved oxygen and freeboard are consistent with Regional Board policy for the prevention of nuisance conditions and overtopping, and are applied to all such facilities.

In order to protect public health and safety, the proposed Order requires the Discharger to comply with the provisions of Title 22 and to implement best management practices with respect to recycled water application (application at reasonable rates considering the crop, soil, and climate).

Monitoring Requirements

Section 13267 of the CWC authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The proposed Order includes influent and effluent monitoring requirements, recycled water storage pond monitoring, recycled water land application area monitoring, groundwater monitoring, sludge monitoring, and water supply monitoring. In order to adequately characterize recycled water, the Discharger is required to monitor for BOD, total coliform organisms, turbidity, TDS, sodium, chloride, nitrogen, and pH. Monitoring of additional minerals is required on an annual basis. To ensure that recycled water storage ponds do not create nuisance conditions, the Discharger is required to monitor freeboard and dissolved oxygen weekly.

The Title 27 zero leakage protection strategy relies heavily on extensive groundwater monitoring to increase a discharger's awareness of, and accountability for, compliance with the prescriptive and performance standards. With recycled water applied to land, monitoring takes on even greater importance. The proposed Order includes monitoring of recycled water quality, application rates, and groundwater quality.

Title 27 regulations pertaining to groundwater monitoring and the detection and characterization of waste constituents in groundwater have been in effect and successfully implemented for many years. No regulation currently specifies similar criteria more suitable for a situation where extensive land application of recycled water occurs. It is appropriate that the Title 27 groundwater monitoring procedures be extended and applied on a case-by-case basis under Water Code Section 13267.

The Discharger must monitor groundwater for recycled water constituents expected to be present in the discharge, and capable of reaching groundwater, and violating groundwater limitations if its treatment, control, and environmental attenuation, proves inadequate. Background groundwater quality is poorly defined; this Order requires evaluation of the existing monitoring wells for suitability, and additional wells to be installed in areas most likely to detect groundwater impacts. Those areas were identified to be locations of recycled water storage ponds or large land application areas. There are a number of small land application areas for which groundwater monitoring is not required. Monitoring at those areas is not required due to their small size and the relatively small amount of recycled water that will be applied. However, the monitoring network is expected to include regional and site specific monitoring wells.

For each constituent listed in the Groundwater Limitations section, the Discharger must, as part of each monitoring event, compare concentrations of constituents found in each monitoring well (or similar type

of groundwater monitoring device) to the background concentration or to prescribed numerical limitations to determine compliance.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop final recycled water and groundwater limitations, so the proposed Order contains interim limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and regulations may change is not sufficient basis for reopening the Order. The CWC requires that waste discharge requirements implement all applicable requirements.

TRO: 2/22/05